

# New Jersey Division of Investment

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**Fiscal Year 2015**

**Annual Investment Plan**

June 23, 2014

State Investment Council Meeting

# Fiscal Year 2015 Annual Investment Plan Agenda

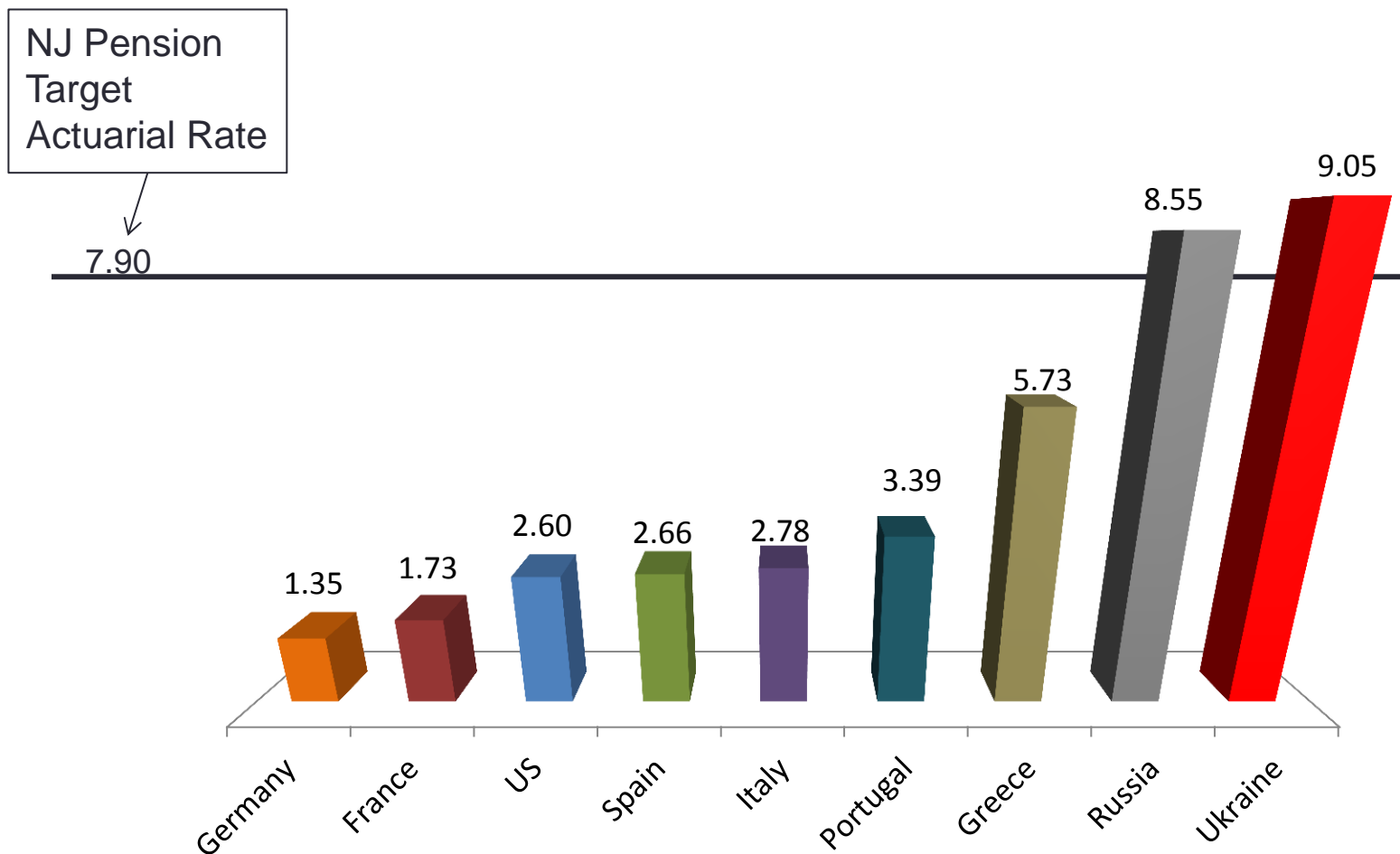
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- Current Market Overview
- Summary of Proposed Targets for FY15
- Peer Asset Allocation Comparisons
- Changes to Asset Allocation Structure
- Fiscal Year 2015 Total Plan Benchmark
- Appendix
  - Additional detail on allocations within each asset class
  - Additional detail on asset allocation structural changes
  - HEK Capital Market Assumptions: 1Q 2014

## Items for SIC Consideration and Approval

- **FY 2015 Asset Class Target Allocation**
- **Fiscal Year 2015 Total Plan Benchmark**

# Yields across Global 10yr Benchmark Bonds

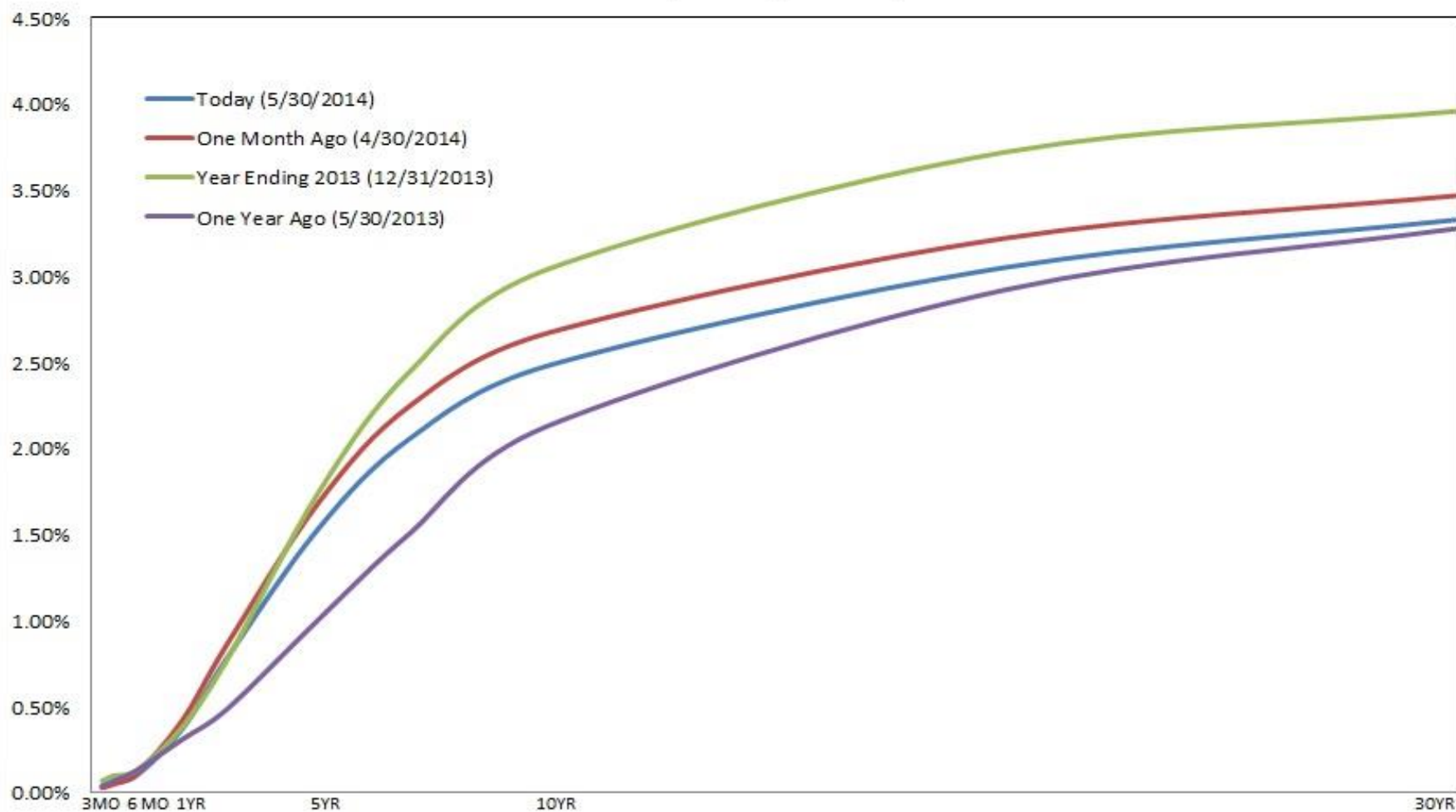


Approximately as of 6/16/14

Yields are higher than one year ago, but lower than expectations

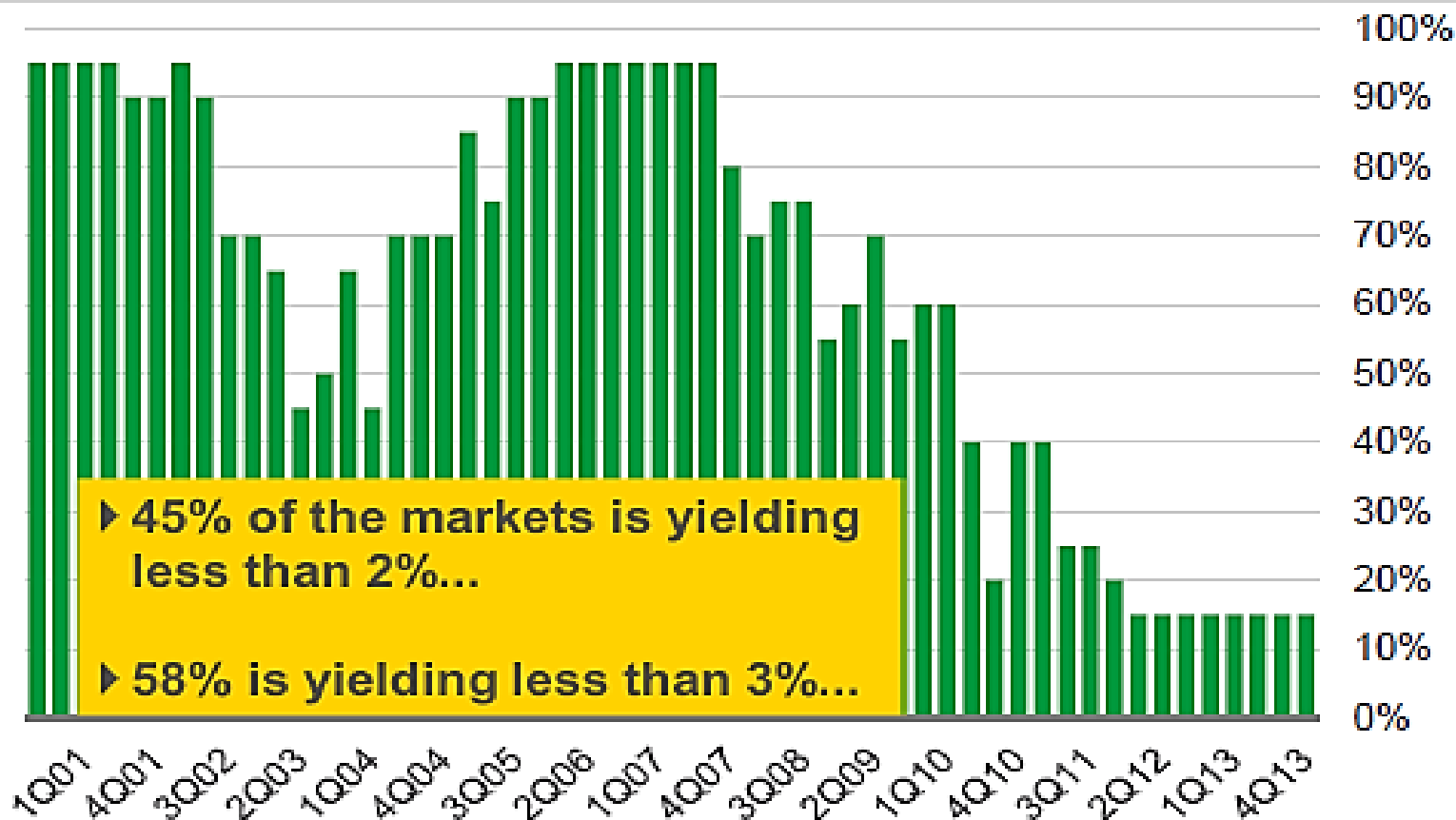
**U.S. TREASURY YIELD CURVE: ON THE RUN 3MO, 6MO, 2YR, 5YR, 10YR & 30YR**

**Period: 5/30/14, 4/30/14, 12/31/13, 5/30/13**



# Search for Yield Continues

**81 % of Fixed Income\* yielding less than 4% (including HY and EM)**

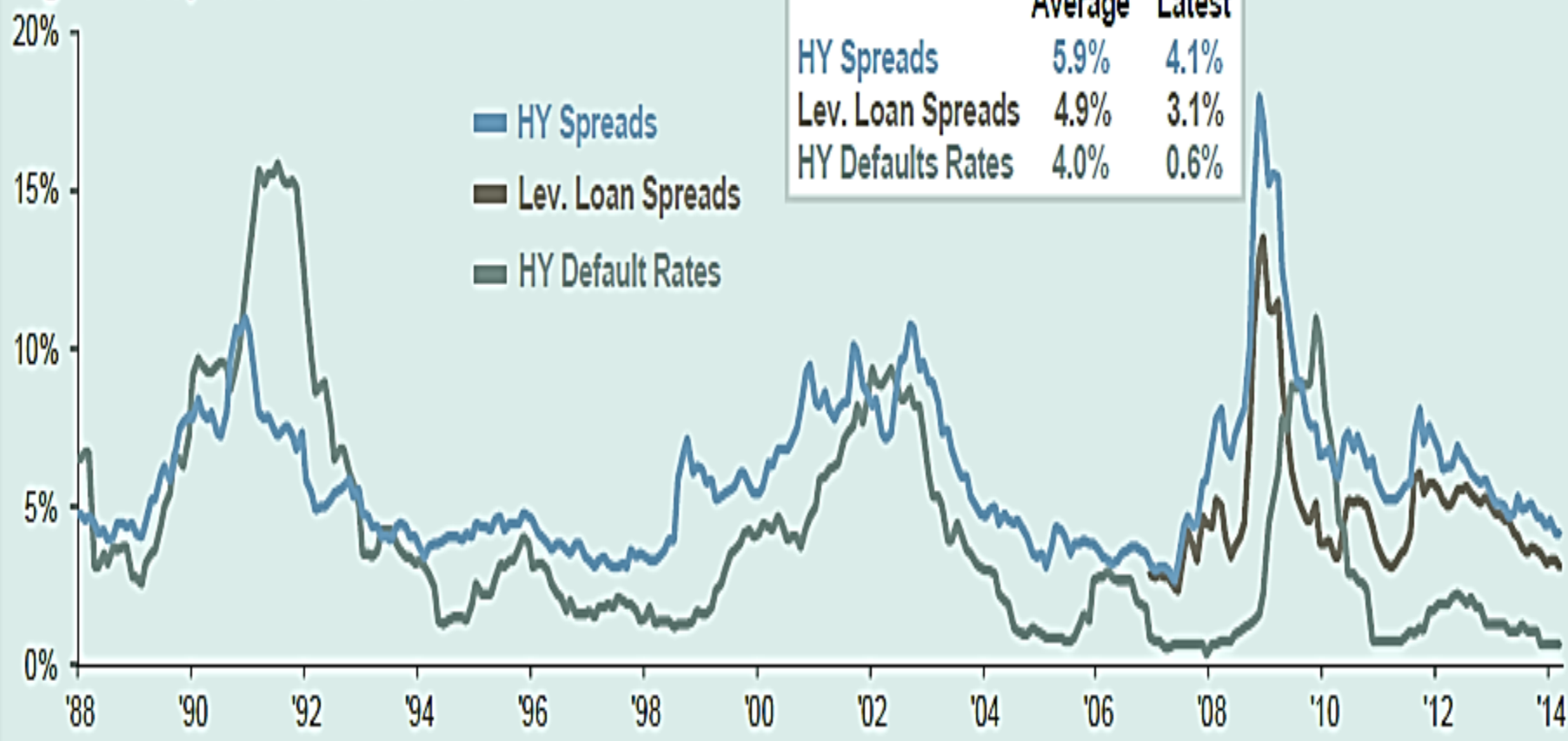


Source: Blackrock

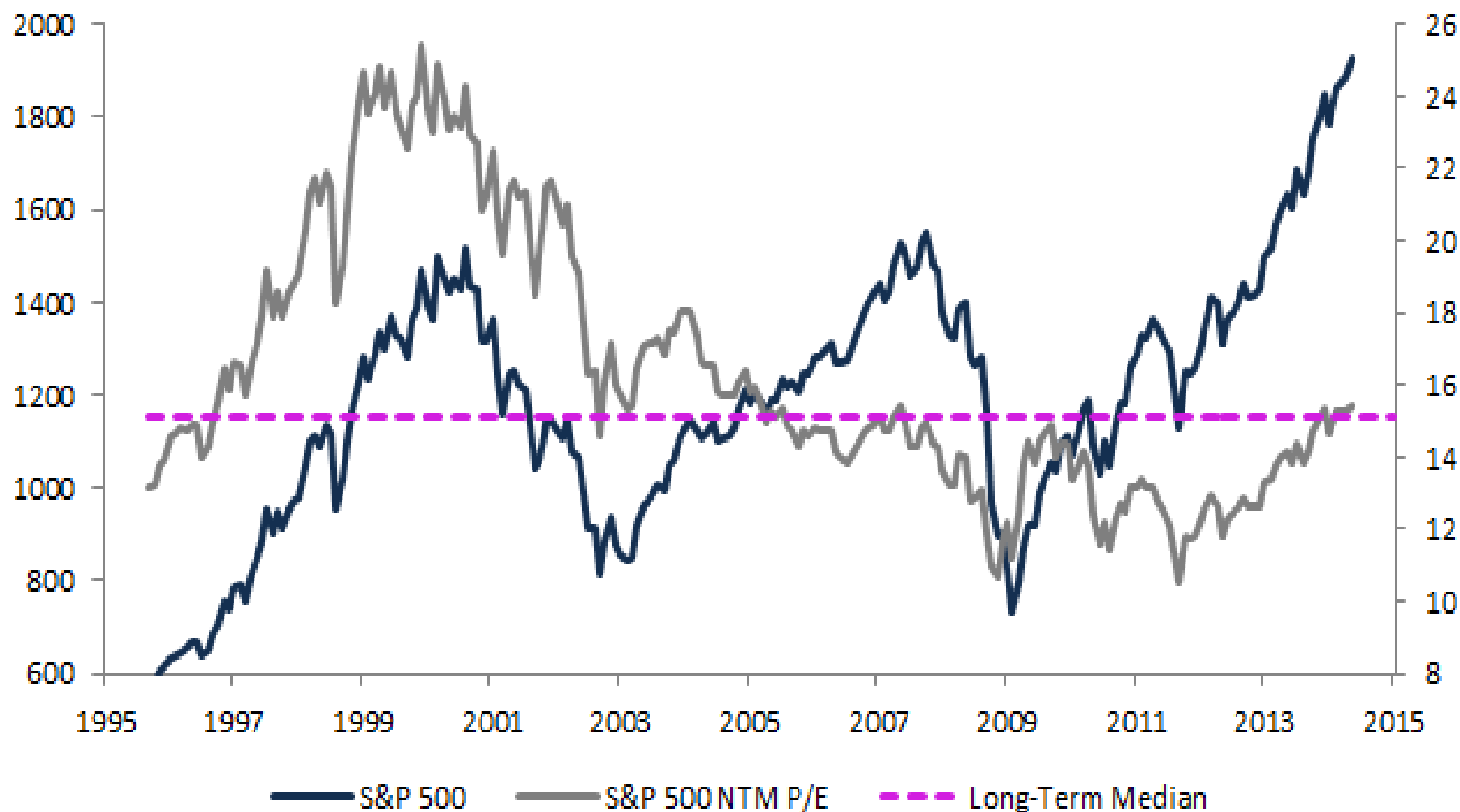
\* Includes US Treasuries, Agencies, Credit, Securitized Assets, CMBS, MBS, HY, and EM

High Yield and Bank Loan spreads are tight and the outlook for defaults remains low. However, historically when defaults rise, it tends to happen dramatically.

High Yield Spreads and Defaults

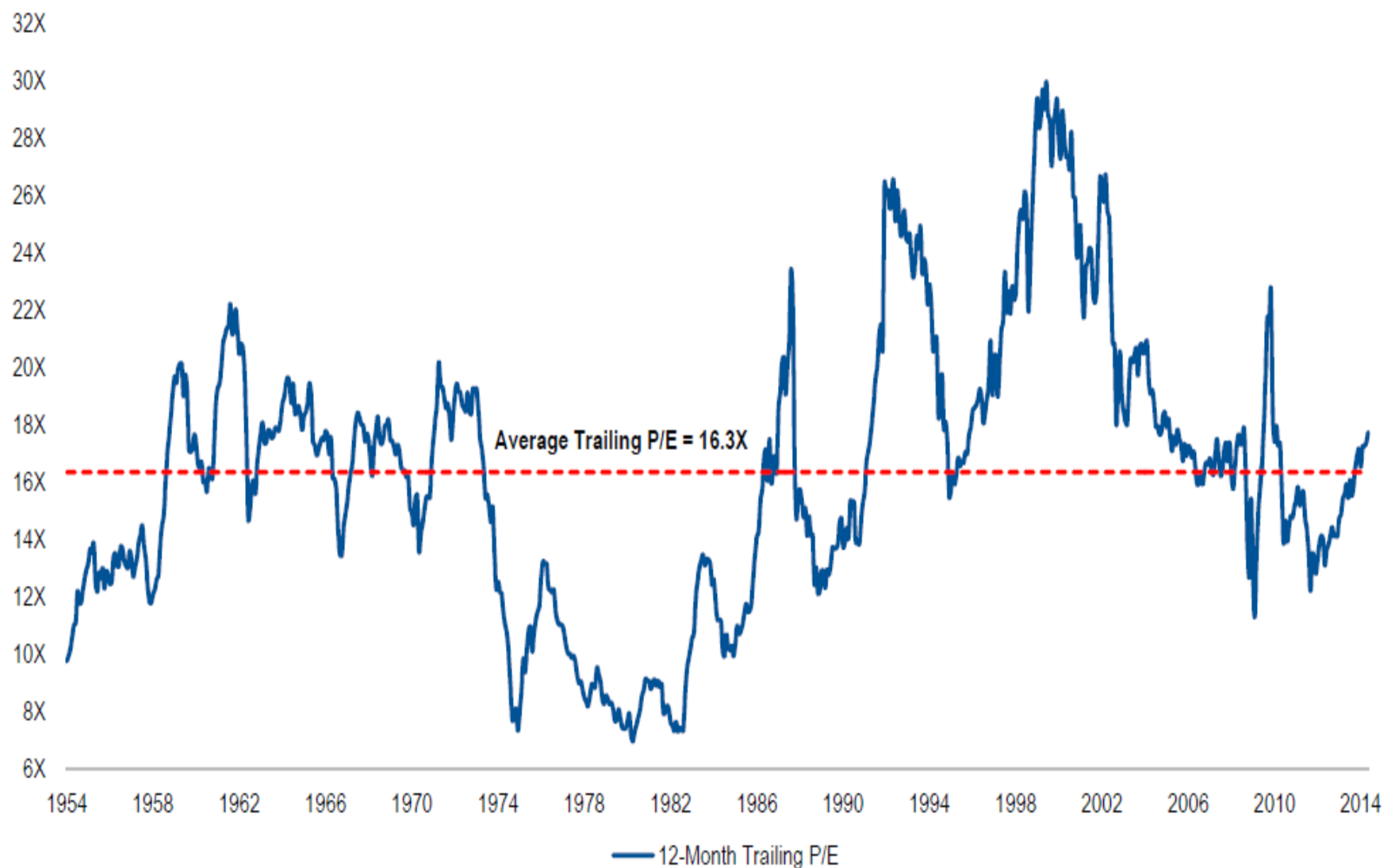


## Strong performance of Equities has brought forward P/E multiples in line with 20 year median



## Trailing P/E for the US Equity Market is slightly above 60 year average

STANDARD & POOR'S 12 MONTH TRAILING P/E RATIO, 1954-2014





## Valuation Ranges of MSCI Regions: 12 Month Forward P/E Over 10 Years

The chart shows the 12M Forward P/E valuation of each region relative to its 10-year history to assess the level of expensive or inexpensive valuation.

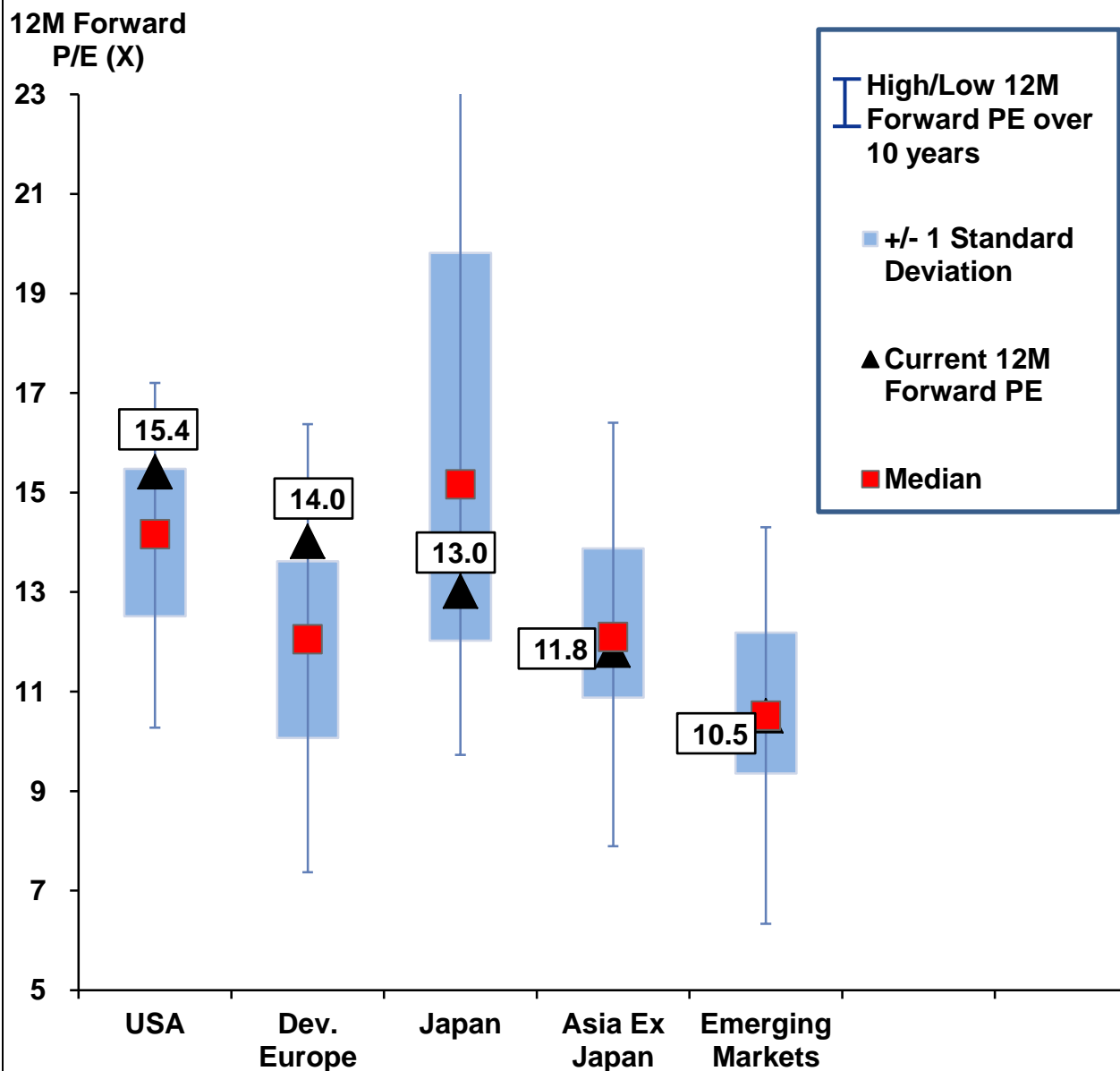
The blue box represents the  $\pm 1$  standard deviation (std. dev.) spread of the 12M FP/E. Example: 68% of the time over 10 years, the US 12M F/PE ranged between 12.5 and 15.5. This spread of 3 is the blue box. Observe that the current 12M FP/E of 15.4 (the triangle) is at the tip of the high end of the box which implies the US is trading at an expensive valuation level relative to last 10 years.

Results:

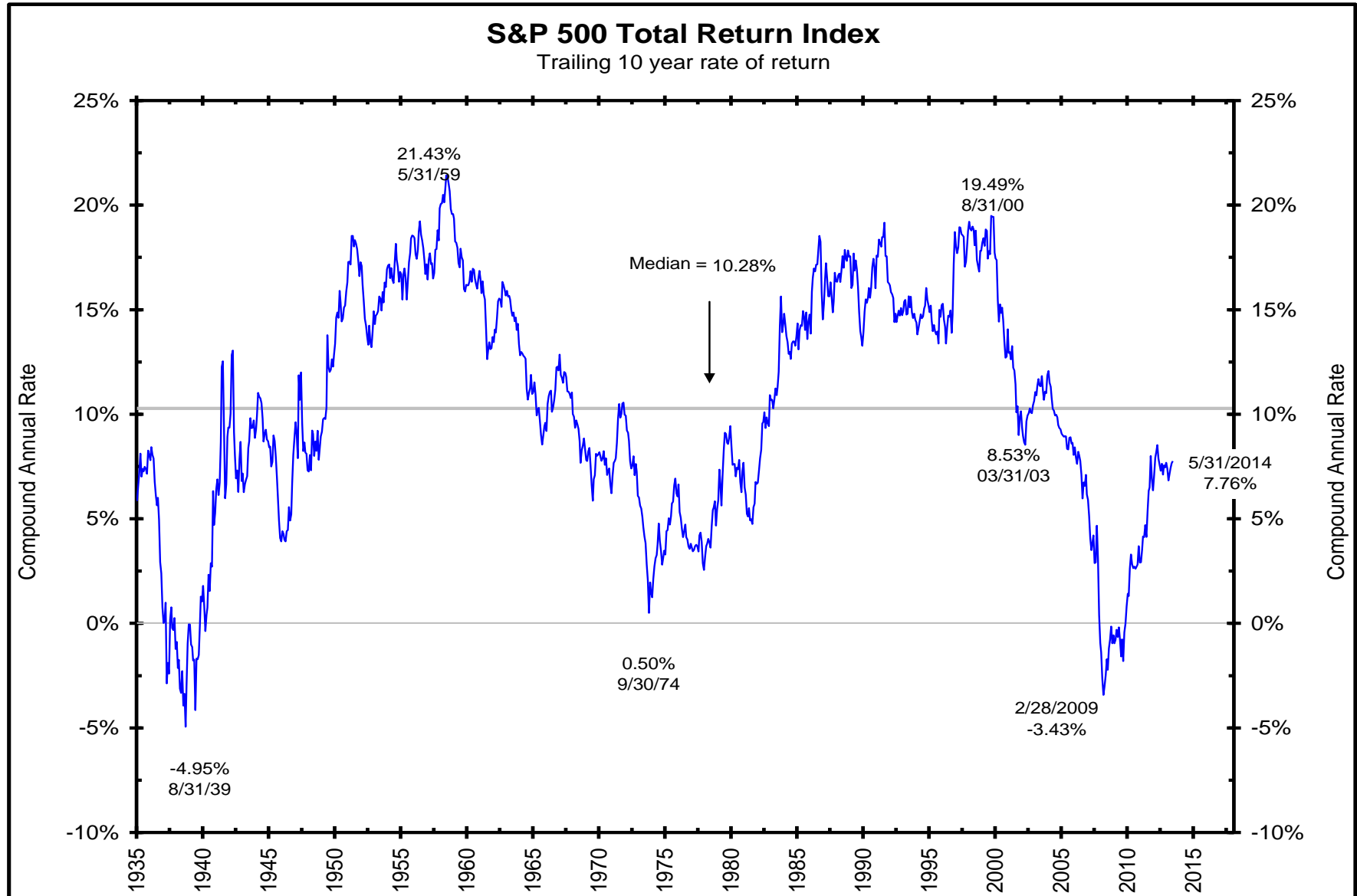
The US and Europe are trading at the high end of their ranges.

Japan is trading at the lower end of its range; it's cheaper vs. the US, just slightly cheaper vs. Europe.

Asia Ex Japan and EM are trading at the lower end of their ranges and at much lower valuation levels than the aforementioned three regions.



## S&P 500 Trailing 10 Year Return Currently Below Median



# Fiscal Year 2015 Proposed Allocation - Expected Risk and Return

Based on HEK Q1 2014 Capital Market Assumptions 10-Year Forecasts

	A	B	C	D	E	F	G	H	I	J	
	Asset Class	Original FY 14 Target	11/30/13 Allocation	Revised FY 2014 Target	5/30/14 Allocation	DOI Proposed FY15 Target Allocation	Higher Income/ Liquidity, Lower Equity Allocation	DOI Long Term Target Range*	HEK 10 Year Expected Return Q1 2014	HEK 10 Year Expected Risk Q1 2014	
1											1
2	<b>RISK MITIGATION</b>	<b>3.50%</b>	<b>2.88%</b>	<b>4.50%</b>	<b>4.05%</b>	<b>4.00%</b>	<b>5.00%</b>	<b>0-5%</b>			2
3	Absolute Return HFs	3.50%	2.88%	4.50%	4.05%	4.00%	5.00%	0-5%	5.3%	8.0%	3
4	<b>LIQUIDITY</b>	<b>4.50%</b>	<b>5.22%</b>	<b>9.50%</b>	<b>7.68%</b>	<b>8.25%</b>	<b>10.00%</b>	<b>2-15%</b>			4
5	Cash/ Short Term Equivalents	1.00%	2.05%	6.00%	4.64%	5.00%	6.00%	0-15%	2.9%	2.0%	5
6	TIPS	2.50%	2.26%	2.50%	2.08%	1.50%	1.00%	0-10%	3.2%	4.5%	6
7	US Treasuries	1.00%	0.92%	1.00%	0.96%	1.75%	3.00%	0-10%	3.1%	3.5%	7
9	<b>INCOME</b>	<b>26.30%</b>	<b>23.98%</b>	<b>24.20%</b>	<b>23.69%</b>	<b>22.60%</b>	<b>29.00%</b>	<b>20-40%</b>			9
10	Invest. Grade Credit	12.10%	12.14%	11.20%	12.48%	10.00%	16.90%	8-23%	4.0%	6.0%	10
11	High Yield	5.50%	5.35%	5.50%	2.32%	2.00%	1.00%	0-8%	4.5%	14.0%	11
12	Global Diversified Credit				2.84%	3.50%	3.50%	0-7%	4.5%	7.0%	12
13	Credit-Oriented HFs	3.50%	3.14%	3.75%	2.95%	4.00%	4.50%	0-6%	6.7%	11.0%	13
14	Debt-Related PE	2.00%	1.12%	1.25%	1.03%	1.00%	1.00%	0-4%	9.3%	16.6%	14
15	Real Estate Debt	2.00%	1.14%	1.30%	0.94%	1.00%	1.00%	1-4%	7.2%	14.5%	15
16	P&F Mortgage	1.20%	1.09%	1.20%	1.13%	1.10%	1.10%	--	3.4%	2.4%	16
19	<b>REAL RETURN</b>	<b>6.00%</b>	<b>6.18%</b>	<b>5.70%</b>	<b>6.12%</b>	<b>7.25%</b>	<b>6.50%</b>	<b>3-12%</b>			19
20	Commodities	2.50%	2.42%	2.50%	1.49%	1.00%	1.00%	0-7%	5.2%	19.0%	20
21	Private Real Assets				1.02%	2.00%	1.50%	0-7%	8.5%	21.3%	21
22	Real Estate Equity	3.50%	3.76%	3.20%	3.61%	4.25%	4.00%	2-7%	7.2%	14.5%	22
23	<b>GLOBAL GROWTH</b>	<b>59.70%</b>	<b>61.46%</b>	<b>56.10%</b>	<b>58.27%</b>	<b>57.90%</b>	<b>49.50%</b>	<b>45-65%</b>			23
24	US Equity	26.50%	28.75%	25.90%	27.23%	27.25%	21.00%	15-35%	6.8%	20.2%	24
25	Non-US Dev Eq	12.70%	14.11%	12.70%	12.98%	12.00%	10.25%	8-20%	7.2%	20.5%	25
26	Emerging Market	8.00%	7.64%	6.50%	6.59%	6.40%	4.25%	5-15%	8.8%	28.5%	26
28	Equity-Oriented HFs	4.00%	4.06%	4.00%	3.85%	4.00%	5.50%	0-8%	6.5%	11.0%	28
29	Buyouts/VC	8.50%	6.90%	7.00%	7.62%	8.25%	8.50%	4-10%	8.5%	31.1%	29
30	OTHER		0.27%	0.00%	0.19%	0.00%	0.00%	0.00%			30
31											31
32	<b>Cash</b>	<b>1%</b>	<b>2%</b>	<b>6%</b>	<b>5%</b>	<b>5%</b>	<b>6%</b>				32
33	<b>Total Investment Grade Fixed Income</b>	<b>16%</b>	<b>15%</b>	<b>15%</b>	<b>16%</b>	<b>13%</b>	<b>21%</b>				33
34	<b>Total Public Equity</b>	<b>47%</b>	<b>50%</b>	<b>45%</b>	<b>47%</b>	<b>46%</b>	<b>36%</b>				34
35											35
36	<b>Expected Nominal Return</b>	<b>7.22%</b>	<b>7.11%</b>	<b>6.92%</b>	<b>7.02%</b>	<b>7.10%</b>	<b>6.78%</b>				36
37	<b>Expected Real Return</b>	<b>4.91%</b>	<b>4.80%</b>	<b>4.62%</b>	<b>4.72%</b>	<b>4.80%</b>	<b>4.48%</b>				37
38	<b>Expected Risk (Volatility)</b>	<b>13.5%</b>	<b>13.5%</b>	<b>12.5%</b>	<b>12.7%</b>	<b>12.9%</b>	<b>11.0%</b>				38
39	<b>Sharpe Ratio</b>	<b>0.321</b>	<b>0.312</b>	<b>0.321</b>	<b>0.323</b>	<b>0.327</b>	<b>0.351</b>				39

\* Maximum allocations to asset classes can not exceed limits per State Investment Council Regulations

## Key Take Aways for FY15 Annual Investment Plan

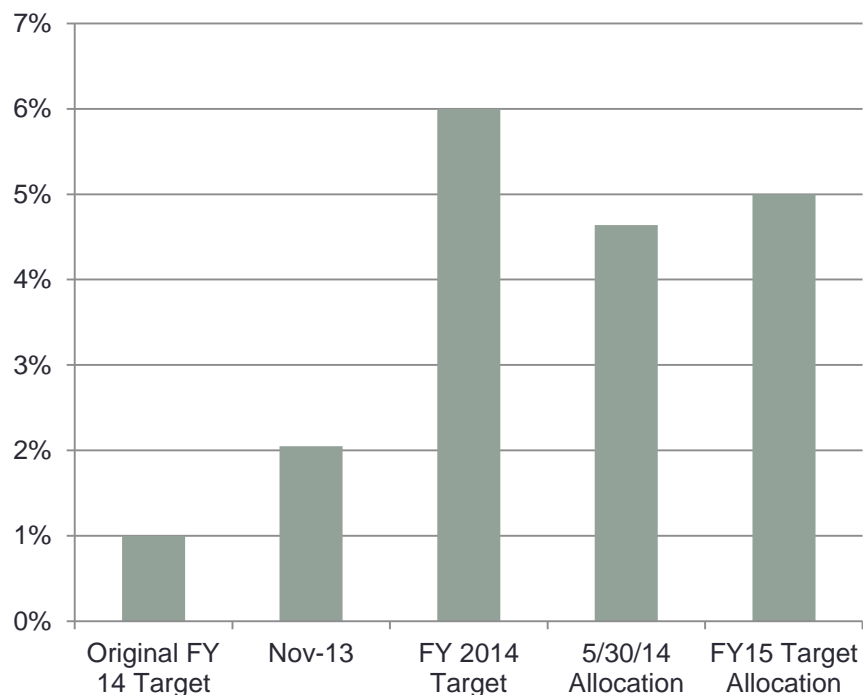
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- The asset allocation was adjusted fairly significantly in late 2013 with increases to Liquidity and Risk Mitigation and a decrease to Global Growth
- Based on current market conditions, the Division's believes a more conservative allocation is still warranted
- Therefore, the proposed FY15 Allocation is largely similar to the Revised FY14 Allocation
- The DOI recommended allocation increases the expected return by 8 bps vs the current allocation and 18 bps vs the FY14 Target. It increases risk by 12 bps and 32 bps vs the current and FY14 target respectively. The recommended mix increases the Sharpe ratio slightly vs. the current and target allocations.
- Cash Target is reduced to 5% from 6%. The Division believes a 5% cash position provides a sufficient cushion for cash flow needs.
- The largest reduction in exposure is to Income where Investment Grade and High Yield allocations are decreased. Both are potentially negatively impacted by rising rates while high yield spreads are extremely tight and leverage is increasing. An increase to Opportunistic Credit (GDC) and Credit Hedge Funds partially offsets the decrease to traditional public credit.
- Real Return experiences the largest increase (113 bps vs current and 155 vs FY14 Target) as exposure to both private real assets and equity real estate increase. DOI continues to see attractive opportunities in the private real asset space and within real estate, particularly in non-major markets and outside the US.
- Global Growth declines slight vs Current, -37 bps, and increases by 180 bps vs FY14 Target. The majority of the increase vs the FY14 target comes from an increase to Buyouts/VC, where the fund is overweight the current target. There is also an increase in Public Equity vs the FY14 Target.

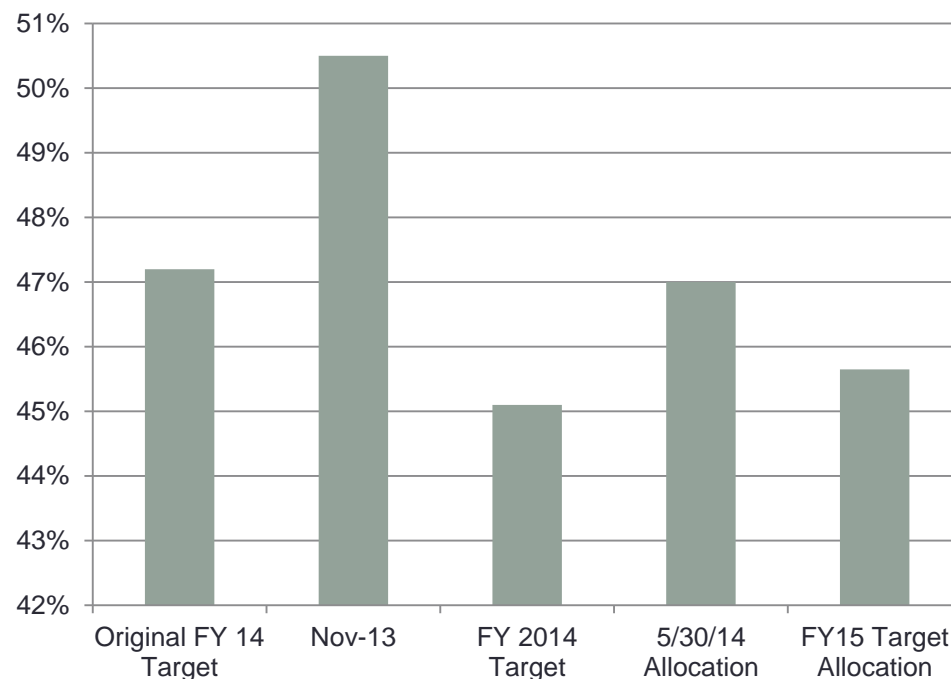
## Recent and Proposed Cash and Public Equity Exposure

The Fund's asset allocation has become more conservative in the last year, as evidenced by the higher allocation to cash and the lower allocation to Public Equities. A cash target of 5% provides the Division with a cushion to ride out any market sell offs without having to liquidate assets to meet cash flow needs for approximately seven months. Public equity exposure peaked at above 50% late in 2013, before being reduced by approximately 10%.

### Cash



### Total Public Equity



## Asset Allocation Targets – Peer Comparison

Asset Class	NJDOI FY 2015 Target	HEK Peer Average	BNY Mellon Public > Billion \$ Universe*	Peer Public Funds										
				1	2	3	4	5	6	7	8	9	10	11
Public Equity	46%	45%	48%	53%	45%	55%	18%	56%	35%	31%	45%	48%	50%	60%
Fixed Income	20%	23%	27%	18%	18%	25%	22%	25%	29%	25%	25%	23%	20%	30%
Alternatives	30%	30%	23%	28%	36%	19%	57%	19%	35%	42%	29%	26%	30%	10%
Cash Equivalents	5%	2%	2%	1%	1%	1%	3%	--	1%	2%	1%	3%	--	--

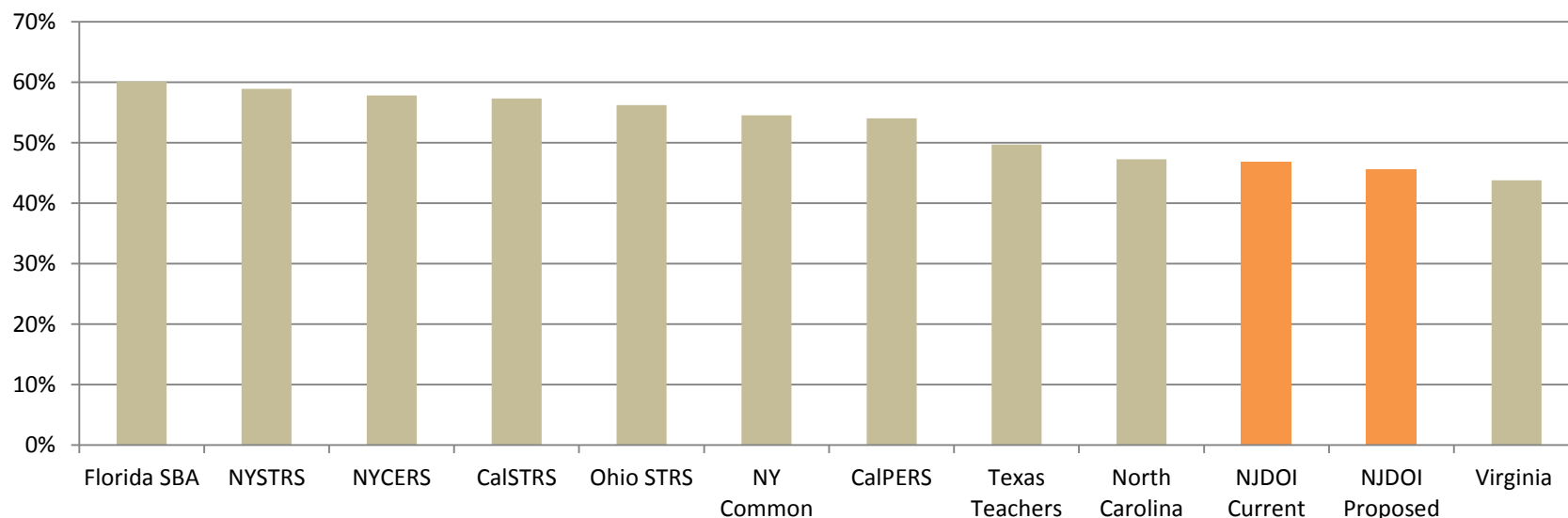
\* BNY Mellon peer information is based on actual peer weights.

- The above custom peer comparison is based on a universe of HEK's 11 largest public pension plans with total assets ranging from \$10 to \$145 billion
  - NJDOI's target allocation is generally in line with the HEK Peer Average with a slight underweight to Fixed Income (-3%) and overweight to Cash Equivalents (+3%).
  - The majority of the above peers have public equity allocations between 45% to 55% with two outliers having only 18% and 31%. These two plans have made policy decisions to be heavily weighted toward Alternatives.
  - In general, the HEK Peer Average is underweight Fixed Income relative to the BNY Mellon universe, which is most likely indicative of the larger plans (represented by HEK Peer Universe) moving more into Alternatives than smaller plans
  - Many of these plans' actual allocations remain heavily weighted toward public equities at this time as they build exposure to Alternatives

# Peer Asset Comparison

Many analyses of asset allocations among peers are based on target asset allocations, which tend to be more readily available, but which may not reflect actual positioning. DOI compiled data for actual Public Equity allocations for a number of other large public pension funds. Data is based on information available on each Plan's website. The average for peer group is 54% vs. 46% proposed target for NJ for FY15. The data reinforces the fact that New Jersey's public equity allocation is conservative relative to its peers.

## Allocation to Global Public Equities



Allocations data is as of 3/31/14 or more recent for all plans except NYSTRS, which is as of 6/30/13.

## Changes to Asset Allocation Structure: High Yield

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- Segment the High Yield allocation into two categories:
  - Traditional Long Only Public High Yield and Bank Loan Strategies
  - Global Diversified Credit Strategies (Opportunistic Credit)
- The current asset allocation framework includes a 5% allocation to High Yield
  - This allocation includes both traditional long only high yield and bank loan allocations as well as allocations that fall under the SIC's Global Diversified Credit (GDC) regulation.
    - Main purpose of the Global Diversified Credit allocation is to capitalize on unique market opportunities that require significant skill to invest in and have higher expected returns over the life of the investment opportunity. A significant portion of the allocation is floating rating, thereby limiting the negative impact of rising rates. These strategies tend to be somewhat less liquid and can include bank loans, direct lending, credit structured products, commercial and residential mortgage backed securities, mezzanine debt, and commercial and residential whole loans.
- The Division believes the differences between traditional High Yield and GDC in terms of return objectives, liquidity, outlook, and instruments used warrant segmenting the portfolio into two different categories. This change will allow for better investment decisions and greater transparency.



## Changes to Asset Allocation Structure: Commodities and Real Assets

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- Segment the Commodities/Real Assets allocation into two categories
  - Commodity Strategies
  - Real Asset Strategies
- The current asset allocation framework includes a 2.5% allocation to Commodities/Real Assets
- This allocation includes strategies tied to traditional commodity indices such as the Dow Jones UBS Index as well as private strategies focused on oil and gas exploration, production, and transportation, shipping, power generation, and infrastructure
  - The Division believes the differences between Commodities and Private Real Assets in terms of return objectives, liquidity, outlook and instruments used warrant segmenting the portfolio into two different categories. This change will allow for better investment decisions and greater transparency.

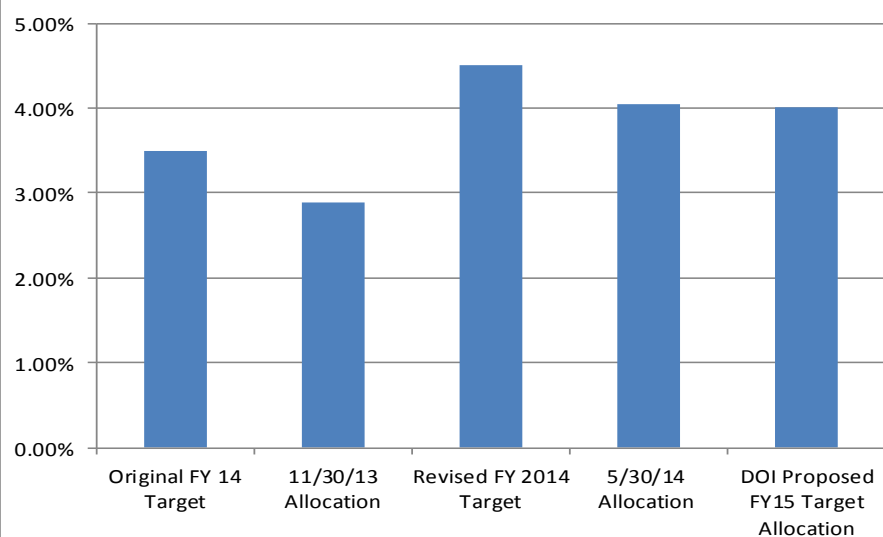
## Fiscal Year 2015 Total Plan Benchmark

The table below shows the proposed components of the Total Plan Benchmark for Fiscal Year 2015 compared to Fiscal Year 2014. Most of the proposed components are unchanged. Several of the components for fixed income segments of the portfolio are simplified from an aggregation of multiple indices to a single index. Also a private equity benchmark for the Real Assets portfolio has been added. Weightings of each component are based on the DOI proposed FY 2015 Asset Allocation.

Asset Class	Sub-Category	Fiscal Year 2014 Component	Fiscal Year 2015 Component	Fiscal Year 2015 Weight
<b>RISK MITIGATION</b>				
	Absolute Return HFs	91-day T-Bills + 300 bps	Same	4.00%
<b>LIQUIDITY</b>				
	Cash Equivalents	91 Day T-Bills	Same	5.00%
	TIPS	BarCap US TIPS 10+ Yr	BarCap US TIPS	1.50%
	US Treasuries	67% BarCap US Treasuries/ 33% BarCap US Treasuries Long	BarCap US Treasuries	1.75%
<b>INCOME</b>				
	Investment Grade Credit	13% BarCap US Credit Index/ 81% BarCap Credit Intermediate/ 6% BarCap Credit Long	BarCap US Credit Index	11.10%
	High Yield Fixed Income	BarCap Corp High Yield	Same	2.00%
	Global Diversified Credit	BarCap Corp High Yield	Same	3.50%
	Credit-Oriented HFs	50% HFRI Distressed Restructuring/50% HFRI Credit Arbitrage (one-month lag)	Same	4.00%
	Debt-Related Private Equity	BarCap Corp High Yield (1 Qtr lag) + 300 bps	Same	1.00%
	Debt-Related Real Estate	BarCap High Yield CMBS (1 Qtr lag) + 300 bps	Same	1.00%
	P&F Mortgage	N/A	N/A	
<b>REAL RETURN</b>				
	Commodities	DJ-UBS Commodities Index	Same	1.00%
	Real Assets	S&P Oil & Gas Exploration and Production Select Industry (one quarter lag)	Cambridge Energy Upstream & Royalties and Private Equity Energy Fund Index (one quarter lag)	2.00%
	Real Estate	NCREIF ODCE (one-quarter lag)	Same	4.25%
<b>GLOBAL GROWTH</b>				
	US Equity	S&P 1500	Same	27.25%
	Non-US Dev Market Eq	MSCI EAFE + Canada (ex-prohibited)	Same	12.00%
	Emerging Market Eq	MSCI Emerging Markets (ex-prohibited)	Same	6.40%
	Equity-Oriented HFs	50% HFRI Equity Hedge/50% HFRI ED Activist (one month lag)	Same	4.00%
	Private Equity/Venture	Cambridge PE (1 Qtr Lag)	Same	8.25%

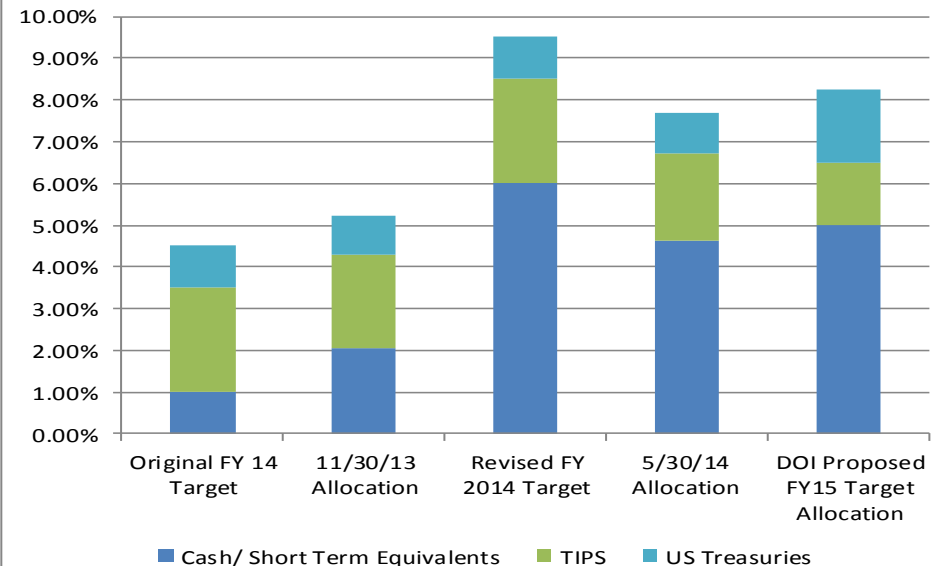
# APPENDIX

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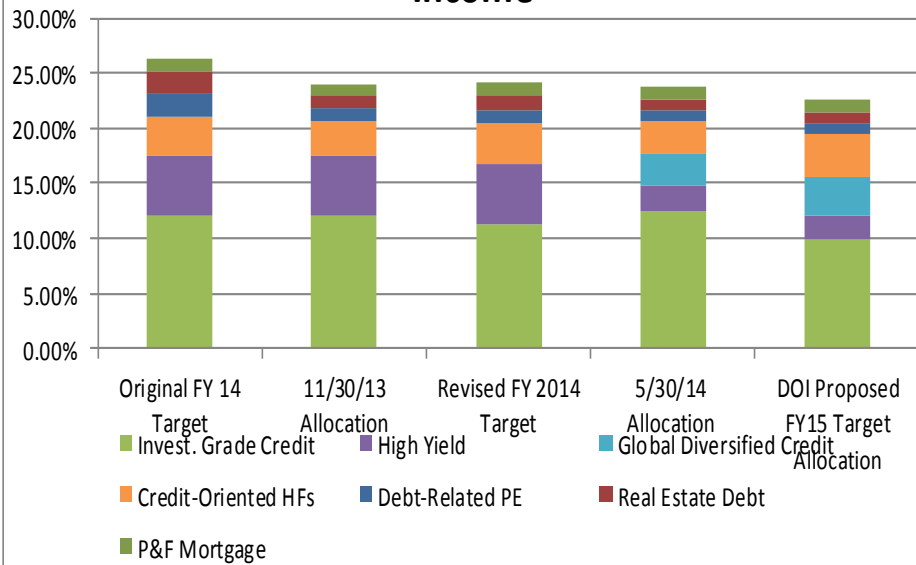
**RISK MITIGATION**

- Risk Mitigation allocation has increased by over \$1.1 billion since start of fiscal year 2014
- Recommendation is to maintain current allocation
- Within the Absolute Return Hedge Fund allocation focus will be on gaining increased exposure to smaller, more nimble funds and strategies that are not correlated with broad market

- The recommendation for the Liquidity asset classes decreases the FY14 target by 1.25%, but is an increase of 0.57% from the current allocation
- A 5% target allocation to cash provides sufficient liquidity to meet cash flow needs
- Combined allocation to Treasuries and TIPS increases slightly vs the current allocation and declines slightly vs the FY14 Target allocation.

**Liquidity**

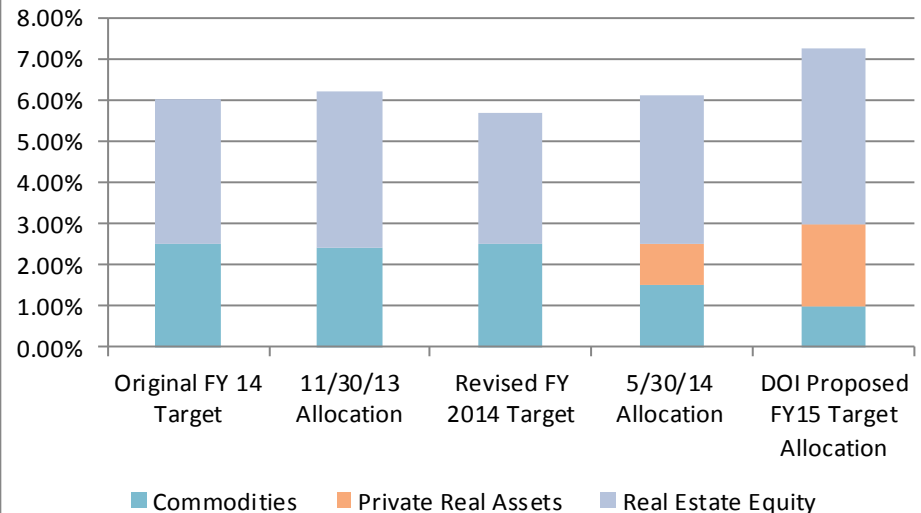
## Income



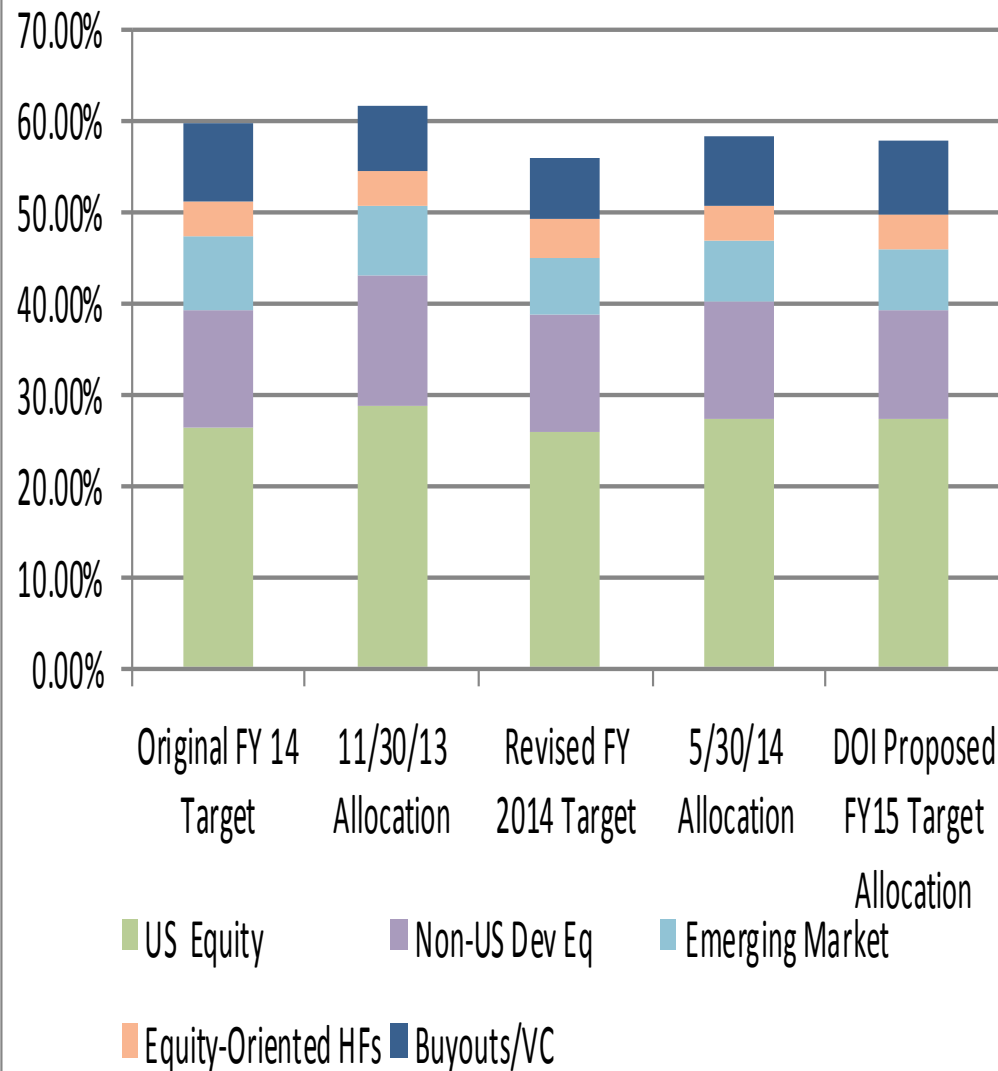
- The recommended target allocation to Income decreases vs both the current allocation and the FY14 Target
- The largest decline is to Investment Grade Credit, while High Yield also declines vs both the current allocation and the FY14 target
- An increase to Opportunistic Credit (GDC) and Credit Hedge Funds partially offsets the decrease to traditional public credit
- Targets to Debt Related Private Equity and Real Estate are decreased relative to the current target based on maturity of those underlying portfolios

- The target to Real Return increases vs the current allocation and the FY14 Target
- The proposed allocation increases the target to private real assets at the expense of the commodities target allocation
- The proposed allocation increases the target to real estate. The proposed target is based on an annual commitment pace of \$500 million to \$750 million

## Real Return



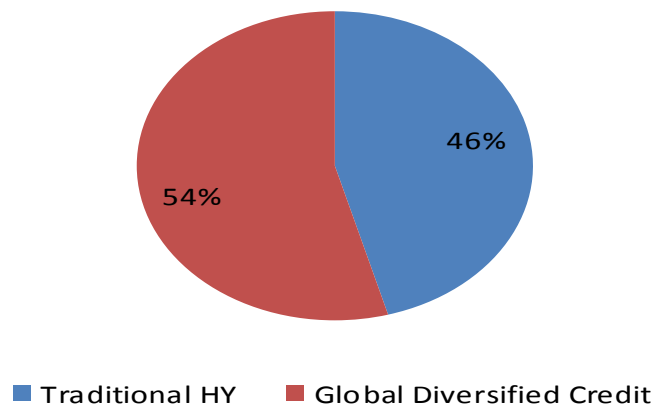
## Global Growth



- The proposed allocation to Global Growth declines vs the current allocation and increases vs the FY14 Target
- The majority of the increase vs the FY14 target comes from an increase to Buyouts/VC, where the fund is overweight the current target. The proposed FY15 allocation to Private equity is based on an expected annual commitment pace of approximately \$1.5 billion
- The proposed allocation to Public Equity increases slightly vs the FY14 Target, entirely through the US allocation, but declines vs the current allocation
- Proposed allocation to Equity Hedge Funds remains consistent with current target and actual allocation

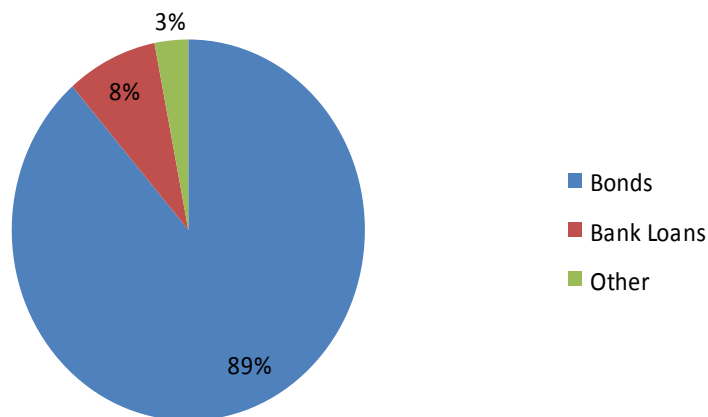
# High Yield Allocation

## High Yield Portfolio

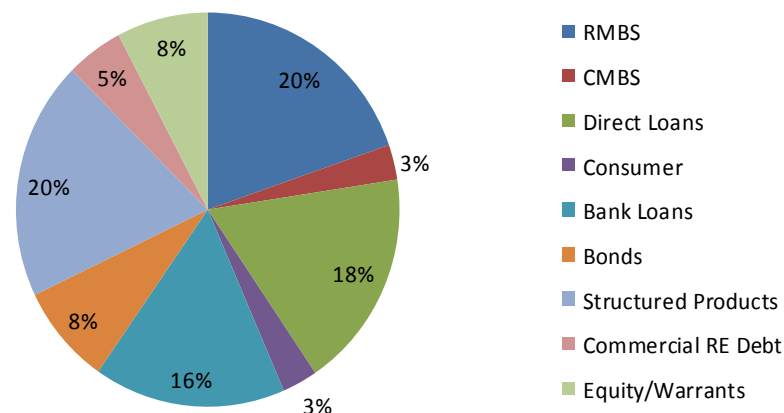


- The current asset allocation framework includes 5.5% target allocation to High Yield (current allocation of 5%).
- This allocation includes both traditional long only high yield and bank loan allocations managed internally and through advisors as well as allocations that fall under the SIC's Global Diversified Credit (GDC) regulation.
- The Global Diversified Credit allocations can include bank loans, direct lending, credit structured products, commercial and residential mortgage backed securities, mezzanine debt, and commercial and residential whole loans.

## Long Only High Yield Portfolio



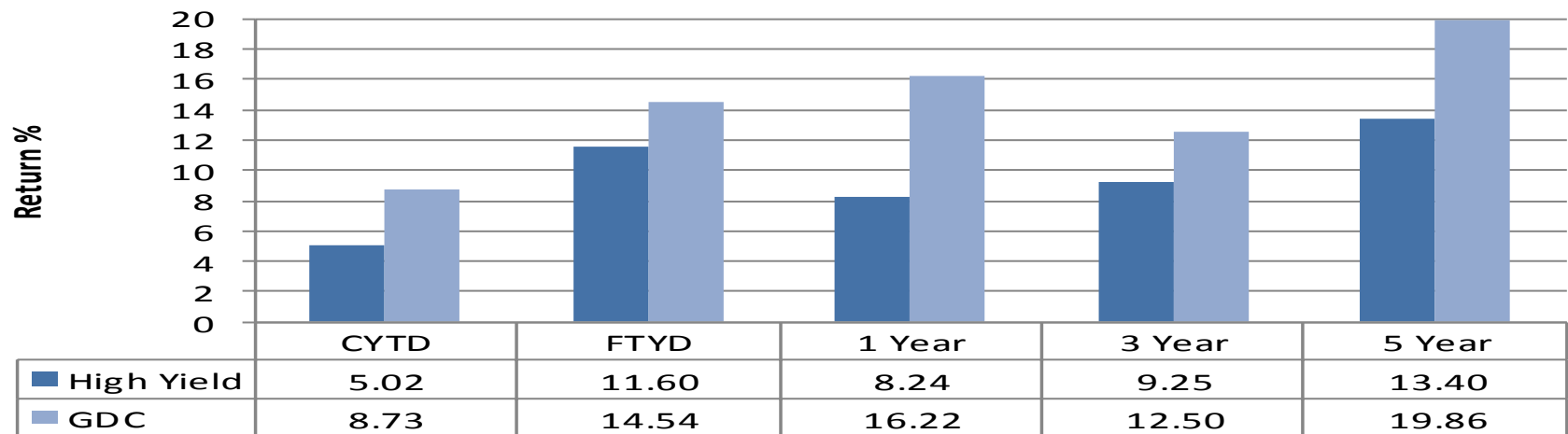
## Global Diversified Credit Portfolio



# High Yield Portfolio Breakdown

- The traditional high yield portfolio is approximately 91% fixed rate and 9% floating rate, has a YTM of 6.27% and a duration of 4.1 years
- The GDC portfolio is approximately 22% fixed rate and 78% floating rate, YTM's range from 7.8% to 10.6%, and duration is well under 4 years where applicable
- Main purpose of the Global Diversified Credit allocation is to capitalize on unique market opportunities that require significant skill to invest in and have higher expected returns over the life of the investment opportunity. A significant portion of the allocation is floating rating, thereby limiting the negative impact of rising rates. These strategies tend to be somewhat less liquid.

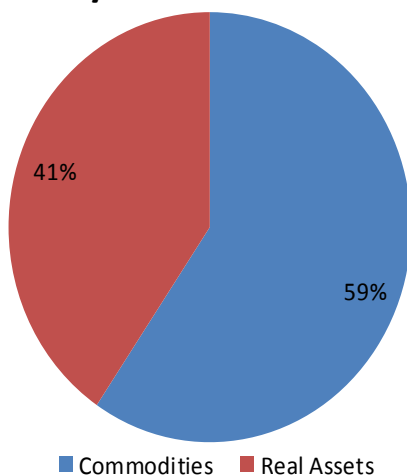
## Performance as of May 30, 2014





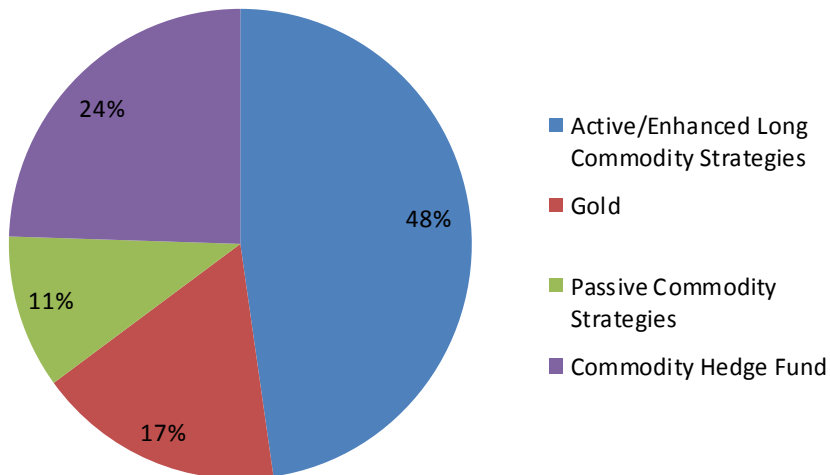
# Commodities/Real Assets Portfolio Breakdown

## Real Assets/ Commodities Portfolio

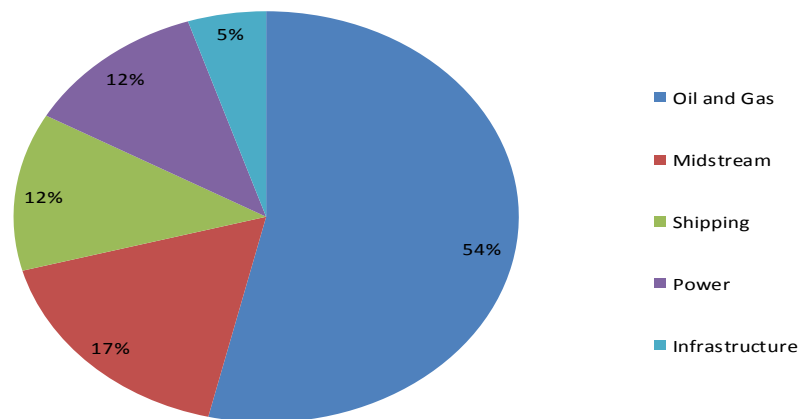


- The current asset allocation framework includes 2.5% target allocation to Commodities/Real Assets (current allocation of 2.5%).
- This allocation includes strategies that are tied to traditional commodity indices such as the Dow Jones UBS Index as well as private strategies that are less influenced by performance of traditional commodity indices

## Commodities Portfolio

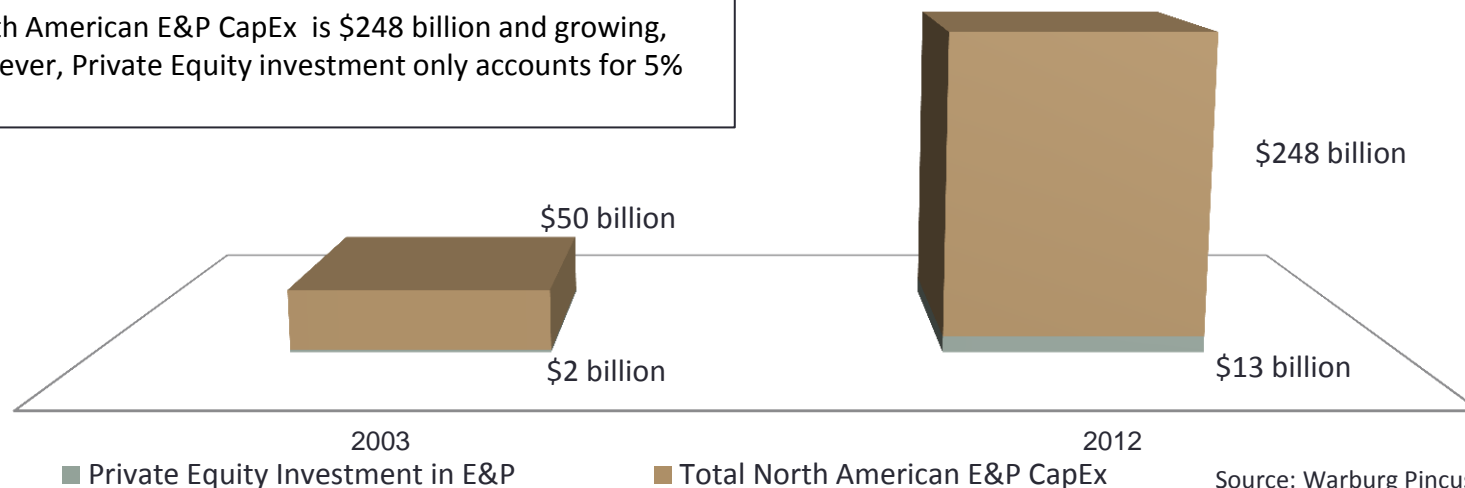


## Real Assets Allocation



## The Case for Energy Investing through Private Equity

North American E&P CapEx is \$248 billion and growing, however, Private Equity investment only accounts for 5%



- Between 1990 and 2012, global oil and gas consumption increased 46%.
- Oil from existing fields is falling by approximately 5 million barrels per day due to natural decline<sup>1</sup>, and demand is estimated to be increasing at approximately 1-1.5 million barrels per day. Moreover, spare capacity is only 3% of global production, down from about 7% through the 1990s<sup>2</sup>.
- Global upstream CapEx was \$723 billion in 2012, 66% of which was spent outside of North America. This is expected to grow to \$924 billion by 2017.
- The capital required to develop just the 12 largest unconventional resource plays is 4.4x the enterprise value of all public independent E&P companies<sup>3</sup>.

**Private equity has certain advantages over public equity in the changing oil and gas landscape including: a longer term focus, lower volatility and the ability to structure deals more creatively**

1) IHS

2) Pareto Securities

3) Bernstein Research

# HEK Q1 2014 Assumptions (10-Year): Expected Returns and Risks

Asset Class	Expected Nominal Return	Expected Nominal Risk (Volatility)
Large Cap U.S. Equity	6.8%	19.0%
Small Cap U.S. Equity	7.0%	25.0%
Global Equity (Developed & Emerging)	7.3%	19.5%
International Equity (Developed)	7.2%	20.5%
Emerging Markets Equity	8.8%	28.5%
Cash (Gov't)	2.9%	2.0%
TIPS	3.2%	4.5%
Core Fixed Income (Market Duration)	3.6%	4.5%
Long Duration Bonds – Credit	4.3%	11.0%
Long Duration Bonds – Govt	3.6%	9.5%
Intermediate Govt Bonds	3.1%	3.5%
Intermediate Corporate Bonds	3.7%	4.0%
High Yield Bonds	4.5%	14.0%
Bank Loans	4.5%	7.0%
Non-US Developed Bonds (0% Hedged)	2.9%	10.0%
Emerging Market Bonds	5.4%	12.0%
Hedge Funds (Median Manager)	5.3%	8.0%
Real Estate (Total Market)	7.2%	14.5%
Commodities	5.2%	19.0%
Private Equity	9.1%	26.0%
Infrastructure	7.8%	16.5%
U.S. Inflation (CPI)	2.2%	1.0%

# HEK Q1 2014 Assumptions (10-Year): Expected Nominal Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1 Large Cap U.S. Equity	1.0	0.9	1.0	0.8	0.8	0.1	0.0	0.0	0.1	-0.1	0.6	0.4	0.0	0.4	0.6	0.4	0.3	0.6	0.4	0.1	0.0	0.1
2 Small Cap U.S. Equity		1.0	0.9	0.7	0.7	0.1	0.0	0.0	0.1	-0.1	0.5	0.4	0.0	0.4	0.5	0.4	0.3	0.6	0.4	0.1	-0.1	0.1
3 Global Equity			1.0	0.9	0.9	0.1	0.0	0.0	0.1	-0.1	0.6	0.4	0.2	0.4	0.6	0.4	0.4	0.6	0.4	0.1	0.0	0.1
4 International Equity (Developed)				1.0	0.8	0.1	0.0	0.0	0.1	-0.1	0.5	0.3	0.4	0.4	0.5	0.4	0.4	0.5	0.3	0.1	0.0	0.1
5 Emerging Markets Equity					1.0	0.1	0.0	0.0	0.1	-0.1	0.6	0.4	0.2	0.5	0.5	0.4	0.3	0.5	0.3	0.1	-0.1	0.1
6 Cash (Gov't)						1.0	0.5	0.6	0.3	0.3	0.2	0.0	0.2	0.3	0.0	0.1	0.2	0.1	0.1	0.5	0.7	0.6
7 TIPS							1.0	0.5	0.2	0.3	0.1	0.0	0.1	0.2	-0.1	0.0	0.2	0.0	0.0	0.4	0.5	0.5
8 Core Fixed Income (Market Duration)								1.0	0.8	0.8	0.5	0.1	0.2	0.6	0.0	0.1	0.1	0.0	0.1	0.2	0.9	1.0
9 Long Duration Bonds – Credit									1.0	0.8	0.6	0.2	0.2	0.7	0.2	0.1	0.0	0.1	0.1	-0.1	0.7	0.8
10 Long Duration Bonds – Gov't										1.0	0.1	-0.3	0.2	0.4	-0.2	0.0	-0.1	-0.1	0.0	-0.1	0.8	0.7
11 High Yield Bonds											1.0	0.7	0.2	0.7	0.6	0.3	0.2	0.4	0.3	0.1	0.2	0.5
12 Bank Loans												1.0	0.0	0.5	0.7	0.2	0.1	0.3	0.2	0.0	-0.2	0.2
13 Non-US Developed Bond (100% Hedged)													1.0	0.2	0.0	0.0	0.4	0.0	0.0	0.2	0.2	0.2
14 Emerging Market Bonds														1.0	0.4	0.2	0.1	0.3	0.2	0.1	0.4	0.6
15 Hedge Funds Universe*															1.0	0.3	0.1	0.4	0.2	0.0	-0.2	0.1
16 Real Estate (Broad Market)																1.0	0.1	0.3	0.2	0.1	0.0	0.1
17 Commodities																	1.0	0.1	0.1	0.4	0.1	0.1
18 Private Equity																		1.0	0.3	0.1	0.0	0.1
19 Infrastructure																			1.0	0.1	0.0	0.1
20 Inflation																				1.0	0.3	0.2
21 Intermediate Govt Bonds																					1.0	0.9
22 Intermediate Corporate Bonds																						1.0

\* Fund of hedge funds

\*\* A correlation of 0.20 and below is shaded in green.  
A correlation of 0.80 and above is shaded in red.